MOUSE HAVING A MASSAGE FEATURE

Description

BACKGROUND OF INVENTION

[0001] Field of the Invention

[0002] The present invention relates generally to an input device to be used in a computer system. More particularly, the present invention relates to a mouse having massage feature.

[0003] Description of the Related Art

[0004] Most computer systems, as for example general purpose computer such as portable computers and desktop computers, receive input from a user via an input device such as a mouse. As is generally well known, the mouse allows a user to move an input pointer (e.g., curser) and to make selections with respect to a graphical user interface (GUI) on a display screen. The mouse typically includes a trackball or optical sensor (located at the bottom side of the mouse) for translating the motion of a user's hand into signals that the computer system can use. For example, by positioning the mouse on a desktop and moving it thereon, the user can move an input pointer or cursor in similar directions within the GUI. The mouse also conventionally includes one or more buttons, which are located on the top side of the mouse. These one or more buttons, when selected, can initiate a GUI action such as a menu or object selections. The one or more buttons are typically provided by one or more button caps (e.g., through an opening in the housing).

[0005] Recently, a scroll wheel has been added to the mouse to give scrolling functionality to a user. The scroll wheel saves time and steps, and allows a user to move through documents by physically rolling the wheel forward or backward instead of clicking on the scroll bar displayed

on the GUI. The scrolling was implemented by selecting the scroll bar with the mouse, and moving the scroll bar on the GUI by moving the mouse up or down. A switch has also been incorporated into some mice for changing the mouse from a cursor control device. In cursor control mode, mouse movements control cursor movements, and in scroll control mode, mouse movements control scroll movements. In most cases, the scroll wheel and switch require a separate mechanical component for actuating the scrolling feature. This device generally requires the mechanical component to be mounted in the mouse with a portion of it protruding out of the mouse housing to allow access to a user's finger, i.e., the housing includes a cut out to allow the mechanical component to protrude through.

[0006] There are continuing efforts to improve form, functionality and feel. For example several forms of housing and operating regions make the mouse's use more comfortable and relaxing. As is well known and widely used, massage is useful in relieving muscle stress. It would be desirable to provide a mouse with a massage mechanism that allows a user to choose whether to activate the mechanism as well as to adjust the level of massage or to disable the mechanism by using a cover which, when assembled to the housing, allows for use of the mouse without massage.

SUMMARY OF INVENTION

[0007] The invention relates, in one embodiment, to a peripheral input device for controlling movements on a display screen. The massage mouse includes a housing, a massage mechanism carried by the housing and a massage cover which assemble into the housing for disabling the massage mechanism and hide the mechanism in a protruding portion out of the mouse housing.

[0008] The invention relates, in another embodiment, to a mouse having a massage region that is integrated into the housing. The massage region represents a working area of the massage mechanism disposed inside the housing.

[0009] The invention relates, in another embodiment, to a mouse having a massage region that is

integrated into the housing and a light detect system which use LDR as light sensor and integrated into the housing. The light detect system is configured to detect the user's grip for activating the massage mechanism in the massage region.

[0010] The invention relates, in another embodiment, to a mouse having a massage region that is integrated into the housing and an adjustable leveling of massage system which uses an adjustable resistor which is mounted in the mouse with portions of it protruding out of the housing to allow access to a user's finger, i.e., the housing includes a cut out to allow a part of the adjustable resistor to protrude through.

BRIEF DESCRIPTION OF DRAWINGS

[0011] The invention will be readily understood by the following detailed description in conjunction with the accompanying drawings, wherein reference numerals designate structural elements, and in which:

[0012] FIG. 1 is a perspective diagram of a peripheral input device, in accordance with one embodiment of the present invention.

[0013] FIG. 2 is a simplified diagram of the peripheral input device components, in accordance with one embodiment of the present invention.

[0014] FIG. 3 is a plan view of the back side of a mouse having massage feature showing the switch, in accordance with one embodiment of the present invention.

[0015] FIGS. 4A-4F show plan views of a mouse having massage feature in accordance with one embodiment of the present invention.

[0016] FIG. 4G shows a perspective view of a mouse having massage feature in accordance with one embodiment of the present invention.

[0017] FIGS. 5A-5F show plan views of the massage disabling cover in accordance with one embodiment of the present invention.

[0018] FIGS. 5G-5H show perspective views of the massage disabling cover in accordance with one embodiment of present the invention.

[0019] FIG. 6A-6F show a plan view of a mouse having massage feature assembled with the massage disabling cover in accordance with one embodiment of the present invention.

[0020] FIG. 6G shows a perspective view of a mouse having massage feature assembled with the massage disabling cover in accordance with one embodiment of the present invention.

[0021] FIGS. 7A-7F show plan views of the massage mechanism with sectional views of the massage region of housing in accordance with one embodiment of the present invention.

[0022] FIG. 7G shows a perspective view of the massage mechanism with a sectional view of the massage region of housing in accordance with one embodiment of the present invention.

[0023] FIG. 8 shows an exploded view of the massage mechanism of the present invention.

[0024] FIGS. 9A-9F show plan views of the cylindrical incline with gear in accordance with one embodiment of the present invention.

[0025] FIGS. 9G shows a perspective view of the cylindrical incline with gear in accordance with one embodiment of the present invention.

[0026] FIG. 10 is an end, cross-section view of the massage region with a cut out of the housing with the massage button and spring which are components of the massage mechanism, in

accordance with one embodiment of the present invention.

[0027] FIG. 11 shows a schematic diagram of the light sensing system according to the present invention.

DETAILED DESCRIPTION

[0028] Embodiments of invention are discussed below with reference to FIGS. 1-11. It is therefore a primary object of the invention to provide a mouse having massage feature. The mouse not only has a tracking movement mechanism for cursor indication, but is also equipped with a massage mechanism.

[0029] FIGS. 4A-4F are plan views of a mouse having massage feature in accordance with one embodiment of the invention. By peripheral input device, it is meant a mouse having massage feature capable to connect and send information to a host system such as a computer system by cable connection. Alternatively, a radio frequency (RF) link or optical infrared (IR) link may be used in order to eliminate the cable. As a peripheral input device, the mouse having massage feature is configured to implement one or more tasks (e.g., specific functions) in the host system. For example, the mouse may be used to control movements and/or perform actions on a display screen of the host system (e.g., via a GUI).

[0030] The mouse having massage feature in FIGS. 4A-4G includes housing that provides a structure for gripping the device during use thereof (e.g., handheld). Referring to FIG. 2, the housing 25 also provides a structure for enclosing, containing and/or supporting the internal components of a mouse having massage feature and supporting the massage disabling cover to assemble to it. For example, the internal components may correspond to a circuitry capable of processing/sending user inputs to the host system. The contour of the housing may be rectilinear, curvilinear or both.

[0031] The mouse having massage feature in FIGS. 4A-4G generally includes a massage region

configured to provide a massage mechanism which is mounted inside the housing and which works there from. The massage region is a portion of the housing and a component of the massage mechanism are the massage buttons. The massage mechanism will work through the massage region using a plurality of massage buttons protruding out of the housing.

[0032] The massage mechanism depicted in FIGS. 7A-7G is mounted inside the housing and is configured to work through the massage region. FIG. 8 shows an exploded view of the massage mechanism. An output shaft is rotatably driven by a motor 1. A worm gear 2 is mounted at the tip of the output shaft that will rotate and drive the first reduction gear 6 by contact gear teeth motion. The first reduction gear 6 continues to drive a second reduction gear 7. The second reduction gear 7 continues to drive the cylindrical incline with gear 12 by contact gear teeth motion. The rotation of the cylindrical incline 12 allows a reciprocating movement of the massage button 14 along the hole designed in the massage region 16. The reciprocating movement of the massage button 14 occurs when the cylindrical incline with gear 12 is continuously rotatably driven, more than one revolution, and as the tip of the massage button is touching the top side of the cylindrical incline. The massage button 14 is mounted through a hole in the massage region 16, so that the movement of the massage button 14 is limited. Thus, the massage button 14 will have a reciprocated movement through the hole designed in the massage region 16. The spring is located between the massage button and inside the surface of the housing as shown in FIG. 10.

[0033] Referring to FIG. 11, the light detect system which uses Light Decreasing Resistor LDR, as a light sensor, is configured to work through a light operable window (see translucent window 21 in FIG. 2) which makes up a substantial portion of the housing and is formed from a light transmissive material and/or translucent material. The light detect system used allows a user to activate the massage mechanism while grabbing the mouse or by other light obstruction actions which do not normally allow the light to pass through the light operable window, as for example covering the light operable window with an opaque material. Meanwhile, the LDR will decrease the electric resistance and the positive voltage signal will proceed from an operational amplifier IC1 with an adjustable resistance R5 (see also adjustable resistance 24 in FIG. 2) controlling the

electric current to be supplied to a motor M1 through a Darlington transistor IC2 and switch SW1 (see also 26 at FIG. 3). The Darlington transistor is used as a current multiplier. Therefore, the current supplied from the source is multiplied through a Darlington transistor to power the motor. The light detect system completes the massage mechanism activation. A DPDT (Double Pole, Double Throw) switch SW1 is chosen for controlling the motor directional rotation. As the DPDT switch is able to select the clockwise and counterclockwise rotation of the motor output shaft which effects the rotational direction of the cylindrical incline, a portion of the cylindrical incline and thereby the relative position of the massage buttons change.

[0034] FIG. 8 shows an exploded view of the massage mechanism. The motor 1 is mounted into a fixture 5 by bolts 3 and 4 and a worm gear 2 is mounted at the tip of an output shaft. A first reduction gear 6 is located at pin 9, and a second reduction gear 7 is located at pin10. The cylindrical incline with gear 12 is located at pin 13, with assembled bearing 11. The bearing 11 is used for supporting the rotation of cylindrical incline with gear 11. Pin 9, 10 and 13 are fixed into the portion of fixture 5 perpendicular to the plane fixing portion of fixture 5. The massage button 14 is configured to work through the hole of the massage region 16 forming a portion of the housing. The spring 15 is located between the massage button and the inner surface of the massage region.

[0035] The output signal from an electric circuitry is transmitted to the outside device through either an output cable or a wireless transmitting circuitry. An output cable passes through the housing at an output transmitting region 2 in FIG. 2. In case of a wireless transmitting circuitry, an output signal is transmitted at an output transmitting region 22 through a signal transmissive material and/or a translucent material and that constitutes a substantial portion of the housing.

[0036] Referring to FIGS. 6A-6G, the massage disabling cover is used for being properly assembled into the mouse housing to help a user disable entirely the massage mechanism. In a preferred embodiment, the massage disabling cover may have any desired shape suitable to hide the massage region. Thus the user is able to grip the assembled set of the mouse having massage feature with the massage disabling cover without touching the massage region. Furthermore, the

massage disabling cover may have any desired shape to provide a comfortable grip.

[0037] It is understood, of course, that while the form of the invention herein shown and described constitutes a preferred embodiment of the invention, it is not intended to illustrate all possible forms thereof. It will also be understood that the words are used as words for description rather than for limitation, and that various changes may be made without departing from the spirit and scope of the disclosed invention.

[0038] Although not shown, the mouse having massage feature may also include one or more buttons that provide clicking for performing actions on the display screen. By way of example, the action may include selecting an item on the screen, opening a file, starting a program, viewing a menu, and/or the like. The buttons may be widely varied. For example, the buttons may be mechanical buttons that are disposed through an opening in the housing or a unified button/housing that incorporates the functionality of a button (or buttons) directly into the housing. The mouse having massage feature may also have a combination of the above (e.g., mechanical buttons and unified button housing). In the illustrated embodiment, the clicking action is provided by a unified button housing and thus there are no separate mechanism buttons.

[0039] Additionally, the mouse having massage feature for performing additional movement on the display screen (e.g., by providing positional data to the host). Examples of position detection mechanism, which may be used, are optical arrangements, trackball arrangements, joystick arrangements, mouse pad 23 (see FIG. 2) arrangements and the like. The position detection mechanism may provide functionality similar to a mouse pad for example, to perform cursor movement.

[0040] In one embodiment, the position detection mechanism, which is commonly used in mice, provides positional data corresponding to movements of the housing when it is moved across a surface (e.g., a desktop). Further, the position detection mechanism is generally positioned on the bottom side of the device (rather than on the top side where the touch pad, i.e., the movement sensitive areas, are located). In one implementation, a bottom side of the housing has an external

contour that substantially conforms to the contour of a flat surface such as a desktop.

[0041] The term "scrolling" as used herein generally pertains to moving displayed data or images (e.g., text or graphics) across a viewing area on a display screen so that a new set of data or images (e.g., line of text or graphics) is brought into view in the viewing area. In most cases, once the viewing is full, each view set of data appears at the edge of the viewing area and all other sets of data move over one position. That is, the new set of data appears for each set of data that moves out of the viewing area. In essence, scrolling allows a user to view consecutive sets of data currently outside of the viewing area (e.g., the window frame). By way of example, the scrolling may be used to help perform internet browsing, spreadsheet manipulation, viewing code, computer aided design, and the like.

[0042] In one embodiment, vertical scrolling is implemented finger is moved across the scrolling region in a first direction, as for example, from front to back or back to front. This particular embodiment is shown in FIG.1. In case of vertical scrolling when a user scrolls (or pans) down, each new set of data appears at the bottom of the viewing area and all other of data appears at the bottom of the viewing area and all other sets of data move up one position. If the viewing area is full, the top set of data moves out of the viewing area. Similarly, when a user scrolls (or pans) up, each new set of data appears at the top of the viewing area and all other sets of data move down one position. If the viewing area is full, the bottom set of data moves out of the viewing area.